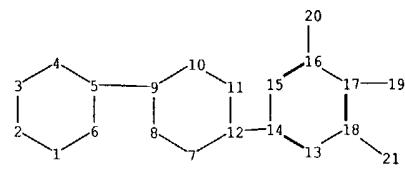
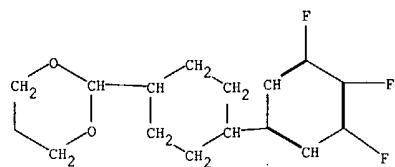


WEST Search History

DATE: Wednesday, June 30, 2004

| <u>Hide?</u> | <u>Set Name</u> | <u>Query</u> | <u>Hit Count</u> |
|---|-----------------|---|------------------|
| <i>DB=USPT,EPAB,JPAB,DWPI,TDBD; PLUR=NO; OP=ADJ</i> | | | |
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| <input type="checkbox"/> | L15 | ?-HEB near F | 10 |
| <input type="checkbox"/> | L14 | ?-GHB near F | 4 |
| <input type="checkbox"/> | L13 | 5-GHB near F | 4 |
| <input type="checkbox"/> | L12 | 5-GHB\$F | 0 |
| <input type="checkbox"/> | L11 | ips with tn with stn | 123 |
| <input type="checkbox"/> | L10 | us-6235355-\$ did. or us-6572938-\$ did. or us-6641872-\$ did. or jp-2002309255-\$ did. | 8 |
| <input type="checkbox"/> | L9 | 5-GHB\$F\$F\$F | 0 |
| <input type="checkbox"/> | L8 | 4-GHB\$F\$F\$F | 0 |
| <input type="checkbox"/> | L7 | 3-GHB\$F\$F\$F | 0 |
| <input type="checkbox"/> | L6 | \$GHB\$F\$F\$F | 0 |
| <input type="checkbox"/> | L5 | GHB\$F\$F\$F | 0 |
| <input type="checkbox"/> | L4 | HEB\$F\$F or HEB\$F\$F\$F | 3 |
| <input type="checkbox"/> | L3 | L2 and l1 | 0 |
| <input type="checkbox"/> | L2 | dcu\$F | 1 |
| <input type="checkbox"/> | L1 | czu\$F or czg\$F | 34 |

END OF SEARCH HISTORY



chain nodes :

19 20 21

ring nodes :

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18

chain bonds :

5-9 12-14 16-20 17-19 18-21

ring bonds :

1-2 1-6 2-3 3-4 4-5 5-6 7-8 7-12 8-9 9-10 10-11 11-12 13-14 13-18 14-15
15-16 16-17 17-18

exact/norm bonds :

1-2 1-6 2-3 3-4 4-5 5-6 7-8 7-12 8-9 9-10 10-11 11-12

exact bonds :

5-9 12-14 16-20 17-19 18-21

normalized bonds :

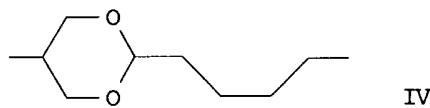
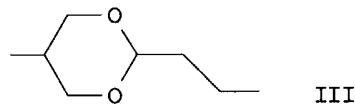
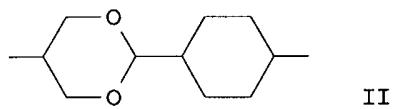
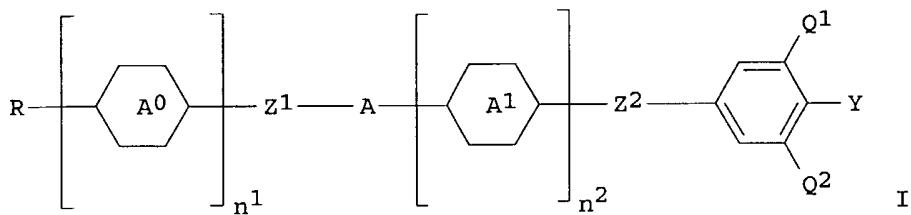
13-14 13-18 14-15 15-16 16-17 17-18

Match level :

1:Atom 2:Atom 3:Atom 4:Atom 5:Atom 6:Atom 7:Atom 8:Atom 9:Atom 10:Atom 11:Atom
12:Atom 13:Atom 14:Atom 15:Atom 16:Atom 17:Atom 18:Atom 19:CLASS 20:CLASS
21:CLASS

AN 1998:268503 CAPLUS
 DN 129:10735
 ED Entered STN: 11 May 1998
 TI Liquid crystal composition containing dioxane derivatives for liquid crystal element
 IN Haseba, Yasuhiro; Kondou, Tomoyuki; Matsui, Shuichi; Miyazawa, Kazutoshi; Takeuchi, Hiroyuki; Hisatsune, Yasusuke; Takeshita, Fusayuki; Nakagawa, Etsuo
 PA Chisso Corp., Japan; Haseba, Yasuhiro; Kondou, Tomoyuki; Matsui, Shuichi; Miyazawa, Kazutoshi; Takeuchi, Hiroyuki; Hisatsune, Yasusuke; Takeshita, Fusayuki; Nakagawa, Etsuo
 SO PCT Int. Appl., 156 pp.
 CODEN: PIXXD2
 DT Patent
 LA Japanese
 IC ICM C07D319-06
 ICS C07D239-26; C09K019-34; C09K019-42; G02F001-13
 CC 74-13 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)
 Section cross-reference(s): 28, 75
 FAN.CNT 1

| | PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|------|---|-----------|----------|-----------------|----------|
| PI | WO 9817664 | A1 | 19980430 | WO 1997-JP2257 | 19970630 |
| | W: AL, AU, BA, BB, BG, BR, CA, CN, CU, CZ, EE, GE, GH, HU, JP, KR, LC, LK, LR, LT, LV, MG, MK, MN, MX, NO, NZ, PL, RO, SG, SI, SK, TR, TT, UA, US, UZ, VN, YU, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM | | | | |
| | RW: GH, KE, LS, MW, SD, SZ, UG, ZW, AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG | | | | |
| AU | 9732768 | A1 | 19980515 | AU 1997-32768 | 19970630 |
| EP | 881221 | A1 | 19981202 | EP 1997-928518 | 19970630 |
| | R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO | | | | |
| CN | 1211978 | A | 19990324 | CN 1997-192489 | 19970630 |
| US | 6235355 | B1 | 20010522 | US 1998-101999 | 19980721 |
| PRAI | JP 1996-297984 | A | 19961022 | | |
| | WO 1997-JP2257 | W | 19970630 | | |
| OS | MARPAT | 129:10735 | | | |
| GI | | | | | |



AB Liquid-crystal compds. useful as the liquid-crystal material for low-voltage driven TFT-type liquid-crystal display devices exhibited a high voltage retention and a remarkably high $\Delta\epsilon$ value. The compds. are elec. and chemical stable and excellent in compatibility with existing liquid-crystal compds. The above compds. are particular dioxane derivs. of general formula I (A = II, III, IV; R = C1-20 alkyl, H; n1, n2 = 0-2; (n1 + n2) ≤ 2; Q1,2 = H, F, Cl; A0, A1 = 1,4-cyclohexylene, etc.; Y, Z1, Z2 = disclosed in claims) and the above compns. contain at least one of the derivs.

ST liq crystal display compn element; dioxane deriv liq crystal display compn

IT Liquid crystal displays

(liquid crystal composition containing dioxane derivs. for liquid crystal element)

IT Liquid crystals

RL: DEV (Device component use); FMU (Formation, unclassified); FORM (Formation, nonpreparative); USES (Uses)

(liquid crystal composition containing dioxane derivs. for liquid crystal element)

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|----|-------------------|-------------------|------------|------------|-------------------|------------|
| IT | 7465-91-0 | 22692-80-4 | 38444-13-2 | 38690-77-6 | 40817-08-1 | 41122-71-8 |
| | 51518-75-3 | 52709-83-8 | 56131-48-7 | 56131-49-8 | 57202-28-5 | |
| | 57202-29-6 | 58743-75-2 | 59855-05-9 | 61203-99-4 | 61204-01-1 | |
| | 61204-03-3 | 63221-88-5 | 64835-59-2 | 67589-39-3 | 67589-41-7 | |
| | 67589-47-3 | 67589-52-0 | 67589-53-1 | 67589-72-4 | 70567-18-9 | |
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| | 79945-42-9 | 80944-44-1 | 80955-71-1 | 81701-13-5 | 81711-13-9 | |
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| | 94737-80-1 | 94737-82-3 | 95495-03-7 | 95495-15-1 | | |
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98495-17-1 100980-86-7 101478-47-1 101559-74-4 102714-93-2
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 207463-17-0 207463-18-1 207463-19-2 207463-20-5

RL: DEV (Device component use); FMU (Formation, unclassified); FORM
 (Formation, nonpreparative); USES (Uses)

(liquid crystal composition containing dioxane derivs. for liquid crystal

element)

IT 97344-78-0P 160910-27-0P 186261-16-5P **207462-53-1P**
 207462-64-4P 207462-94-0P 207463-00-1P 207463-05-6P 207463-14-7P

RL: DEV (Device component use); FMU (Formation, unclassified); SPN
 (Synthetic preparation); FORM (Formation, nonpreparative); PREP
 (Preparation); USES (Uses)

(liquid crystal composition containing dioxane derivs. for liquid crystal

element)

IT 64-18-6, Formic acid, reactions 455-19-6, 4-Trifluoromethylbenzaldehyde
 2612-28-4 4746-97-8, 1,4-Dioxaspiro[4.5]decan-8-one 6297-22-9, Methyl
 4-oxocyclohexanecarboxylate 25462-23-1, 2-Pentyl-1,3-propanediol
 32085-88-4, 3,5-Difluorobenzaldehyde 60811-18-9, 3-Fluoro-4-
 chlorobromobenzene 69891-92-5 99627-05-1, 3,4,5-Trifluorophenol
 105529-58-6, 3-Fluoro-4-trifluoromethoxybromobenzene 138526-69-9,
 3,4,5-Trifluorobromobenzene

RL: RCT (Reactant); RACT (Reactant or reagent)

(liquid crystal composition containing dioxane derivs. for liquid crystal

element)

IT 54274-80-5P 82989-27-3P 156265-95-1P 160148-05-0P,
 4-(3,4,5-Trifluorophenyl)cyclohexanone 160148-06-1P 160910-28-1P
 163978-51-6P 166947-09-7P, 3-(4-Trifluoromethylphenyl)propanal
 176765-67-6P 207462-72-4P 207462-77-9P 207462-85-9P 207463-02-3P
 207463-04-5P 207463-08-9P 207463-11-4P 207463-13-6P

RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT
 (Reactant or reagent)

(liquid crystal composition containing dioxane derivs. for liquid crystal

element)

RE.CNT 22 THERE ARE 22 CITED REFERENCES AVAILABLE FOR THIS RECORD

RE

- (1) Chisso Corp; EP 193191 A2 1986 CAPLUS
- (2) Chisso Corp; JP 61-197563 A 1986 CAPLUS
- (3) F Hoffmann Roche Ag F; JP 05-186376 A 1993 CAPLUS
- (4) F Hoffmann Roche Ag F; JP 07-2832 A 1995 CAPLUS
- (5) F Hoffmann Roche Ag F; EP 433836 A1 1995 CAPLUS
- (6) F Hoffmann Roche Ag F; US 5322638 A 1995 CAPLUS
- (7) Merck Patent GmbH; JP 58-159488 A 1983 CAPLUS
- (8) Merck Patent GmbH; EP 87679 A1 1983 CAPLUS
- (9) Merck Patent GmbH; EP 207975 A1 1987 CAPLUS

(10) Merck Patent GmbH; US 4818428 A 1987 CAPLUS
(11) Merck Patent GmbH; JP 62-501509 A 1987
(12) Merck Patent GmbH; JP 04-501272 A 1992
(13) Merck Patent GmbH; JP 04-503678 A 1992
(14) Merck Patent GmbH; EP 438574 A1 1992 CAPLUS
(15) Merck Patent GmbH; EP 457878 A1 1992 CAPLUS
(16) Merck Patent GmbH; US 5250220 A 1992 CAPLUS
(17) Merck Patent GmbH; WO 912780 A 1992
(18) Merck Patent GmbH; WO 919026 A 1992
(19) Merck Patent GmbH; JP 09-12569 A 1997 CAPLUS
(20) Merck Patent GmbH; DE 19522529 A 1997 CAPLUS
(21) Veb Werk Fur Fernseelektronik Im Veb Kombinat Mikroelektronik; GB 2164645
A 1986 CAPLUS

(22) Veb Werk Fur Fernseelektronik Im Veb Kombinat Mikroelektronik; JP
61-76480 A 1986 CAPLUS

IT 94737-79-8 94737-80-1 94737-82-3

132123-44-5 207463-16-9

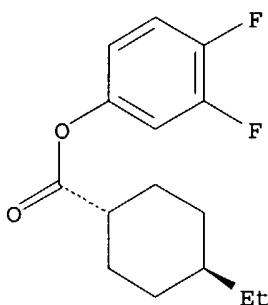
RL: DEV (Device component use); FMU (Formation, unclassified); FORM
(Formation, nonpreparative); USES (Uses)

(liquid crystal composition containing dioxane derivs. for liquid crystal
element)

RN 94737-79-8 CAPLUS

CN Cyclohexanecarboxylic acid, 4-ethyl-, 3,4-difluorophenyl ester, trans-
(9CI) (CA INDEX NAME)

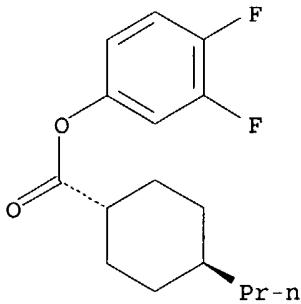
Relative stereochemistry.



RN 94737-80-1 CAPLUS

CN Cyclohexanecarboxylic acid, 4-propyl-, 3,4-difluorophenyl ester, trans-
(9CI) (CA INDEX NAME)

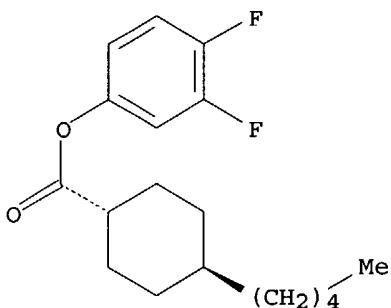
Relative stereochemistry.



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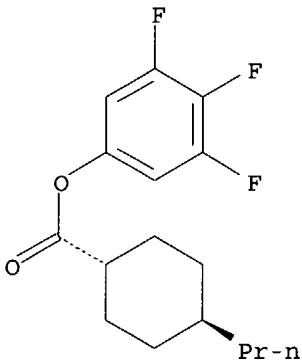
CN Cyclohexanecarboxylic acid, 4-pentyl-, 3,4-difluorophenyl ester, trans-
(9CI) (CA INDEX NAME)

Relative stereochemistry.



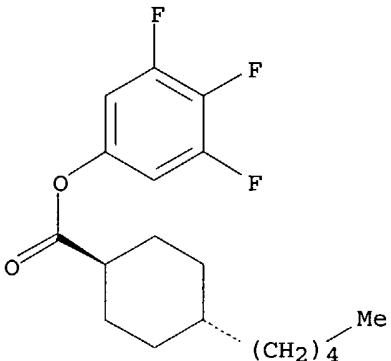
RN 132123-44-5 CAPLUS
 CN Cyclohexanecarboxylic acid, 4-propyl-, 3,4,5-trifluorophenyl ester, trans-
 (9CI) (CA INDEX NAME)

Relative stereochemistry.



RN 207463-16-9 CAPLUS
 CN Cyclohexanecarboxylic acid, 4-pentyl-, 3,4,5-trifluorophenyl ester, trans-
 (9CI) (CA INDEX NAME)

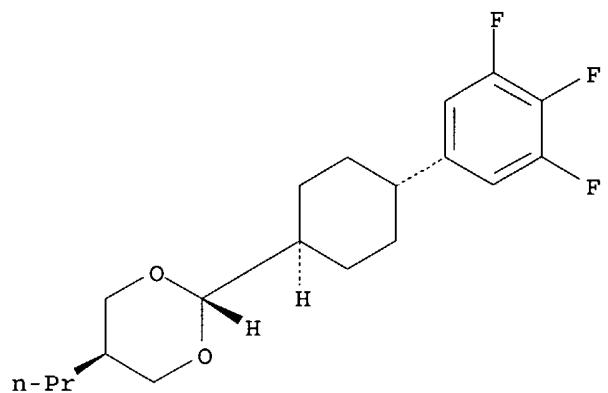
Relative stereochemistry.



IT 207462-53-1P
 RL: DEV (Device component use); FMU (Formation, unclassified); SPN
 (Synthetic preparation); FORM (Formation, nonpreparative); PREP
 (Preparation); USES (Uses)
 (liquid crystal composition containing dioxane derivs. for liquid crystal
 element)
 RN 207462-53-1 CAPLUS
 CN 1,3-Dioxane, 5-propyl-2-[trans-4-(3,4,5-trifluorophenyl)cyclohexyl]-,

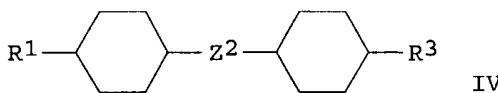
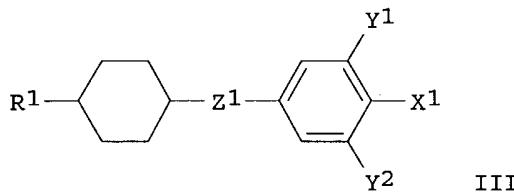
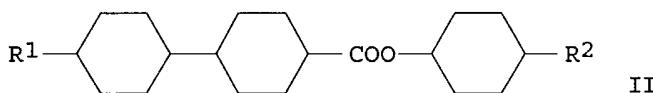
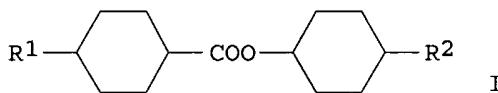
trans- (9CI) (CA INDEX NAME)

Relative stereochemistry.



AN 2001:581512 CAPLUS
 DN 135:160219
 ED Entered STN: 10 Aug 2001
 TI Liquid crystal composition and liquid crystal display device
 IN Yanai, Motoki; Kubo, Yasuhiro; Nakagawa, Etsuo
 PA Chisso Corp., Japan; Chisso Petrochemical Corp.
 SO Eur. Pat. Appl., 39 pp.
 CODEN: EPXXDW
 DT Patent
 LA English
 IC ICM C09K019-30
 ICS C09K019-42
 CC 74-13 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)
 Section cross-reference(s): 75
 FAN.CNT 1

| | PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|------|--|------|----------|-----------------|----------|
| PI | EP 1122292 | A2 | 20010808 | EP 2001-102169 | 20010202 |
| | EP 1122292 | A3 | 20011107 | | |
| | EP 1122292 | B1 | 20030618 | | |
| | R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO | | | | |
| | JP 2001288470 | A2 | 20011016 | JP 2000-160243 | 20000530 |
| | US 2002066887 | A1 | 20020606 | US 2001-773536 | 20010202 |
| | US 6572938 | B2 | 20030603 | | |
| PRAI | JP 2000-27959 | A | 20000204 | | |
| | JP 2000-160243 | A | 20000530 | | |
| OS | MARPAT 135:160219 | | | | |
| GI | | | | | |



AB The present invention is to provide a liquid crystal composition which has

particularly a high upper limit temperature of a nematic phase, a low lower limit temperature of the nematic phase and a small birefringence while satisfying general characteristics required to the liquid crystal composition for

an AM-LCD. Liquid crystal compns. are disclosed which comprising a component (1) comprising at least one compound selected from the group of compds. represented by I or II ($R_{1,2}$ = alkyl, alkoxy, C₁₋₁₀ alkoxyethyl or C₂₋₁₀ alkenyl), a component (2) comprising at least one compound selected from the group of compds. such as III (Z_1 = single bond or -CH₂CH₂-; X_1 = F, Cl, OCH₂ or OCF₃; Y_{1-2} = H or F) and a component (3) comprising at least one compound selected from the group of compds. such as IV (R_3 = alkyl, alkoxy, C₁₋₁₀ alkoxyethyl, C₂₋₁₀ alkenyl; R_1 = alkyl, alkoxy, C₁₋₁₀ alkoxyethyl or C₂₋₁₀ alkenyl; Z_2 = single bond, -CH₂CH₂- or -CH=CH-).

ST nematic liq crystal compn cyclohexyl phenyl deriv; active matrix liq crystal display device

IT Liquid crystal displays
Liquid crystals

(Liquid crystal composition and liquid crystal display device)

| | | | | | |
|----|-------------|--------------------|--------------------|-------------|-------------|
| IT | 73255-59-1 | 73255-62-6 | 76802-59-0 | 79284-92-7 | 79646-68-7 |
| | 79709-84-5 | 79912-81-5 | 80944-44-1 | 81701-13-5 | 82832-27-7 |
| | 82832-32-4 | 82832-57-3 | 82832-58-4 | 83242-83-5 | 84360-96-3 |
| | 84655-98-1 | 84656-75-7 | 86778-48-5 | 88038-92-0 | 88416-69-7 |
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| | 132123-45-6 | 133058-92-1 | 133914-49-5 | 133937-72-1 | 136428-57-4 |
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| | 352566-03-1 | 352566-04-2 | 352566-05-3 | 352566-06-4 | |

RL: DEV (Device component use); USES (Uses)

(Liquid crystal composition and liquid crystal display device)

IT **94737-80-1** **207462-53-1** **207463-16-9**

352566-05-3

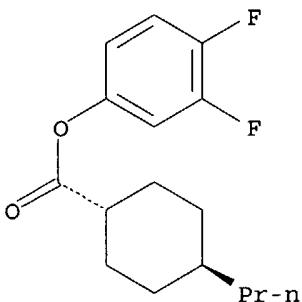
RL: DEV (Device component use); USES (Uses)

(Liquid crystal composition and liquid crystal display device)

RN 94737-80-1 CAPLUS

CN Cyclohexanecarboxylic acid, 4-propyl-, 3,4-difluorophenyl ester, trans- (9CI) (CA INDEX NAME)

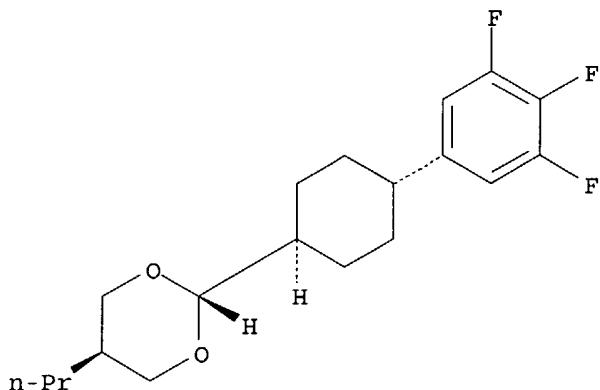
Relative stereochemistry.



RN 207462-53-1 CAPLUS

CN 1,3-Dioxane, 5-propyl-2-[trans-4-(3,4,5-trifluorophenyl)cyclohexyl]-, trans- (9CI) (CA INDEX NAME)

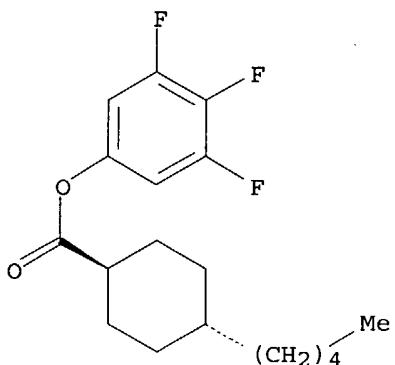
Relative stereochemistry.



RN 207463-16-9 CAPLUS

CN Cyclohexanecarboxylic acid, 4-pentyl-, 3,4,5-trifluorophenyl ester, trans- (9CI) (CA INDEX NAME)

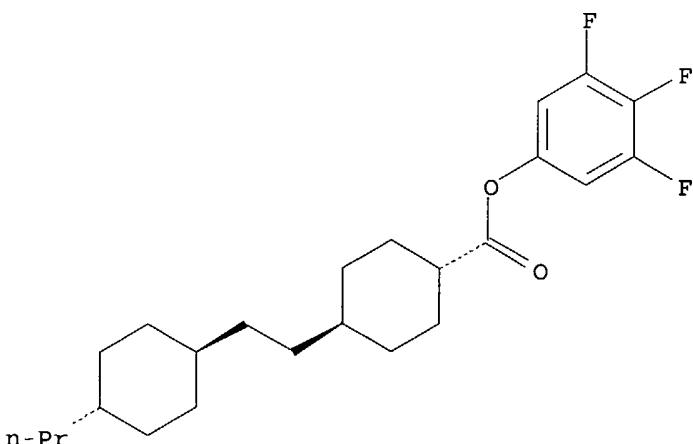
Relative stereochemistry.



RN 352566-05-3 CAPLUS

CN Cyclohexanecarboxylic acid, 4-[2-(trans-4-propylcyclohexyl)ethyl]-, 3,4,5-trifluorophenyl ester, trans- (9CI) (CA INDEX NAME)

Relative stereochemistry.



AN 2002:400386 CAPLUS
 DN 136:409119
 ED Entered STN: 29 May 2002
 TI Liquid crystal compositions with reduced refractive index anisotropy and their displays with wide range of operation temperature
 IN Kubo, Yasuhiro; Terashima, Kenji
 PA Chisso Corp., Japan; Chisso Petrochemical Corporation
 SO Jpn. Kokai Tokkyo Koho, 24 pp.
 CODEN: JKXXAF
 DT Patent
 LA Japanese
 IC ICM C09K019-42
 ICS C09K019-30; C09K019-34; G02F001-13
 CC 74-13 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)
 Section cross-reference(s): 75
 FAN.CNT 1

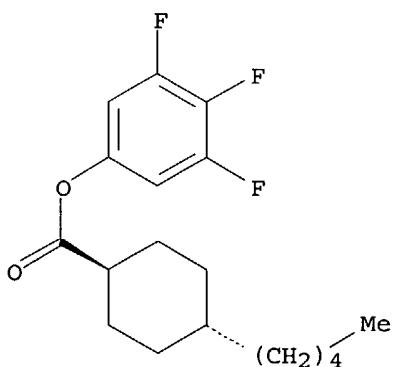
| | PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|------|---|------------|----------|-----------------|----------|
| PI | JP 2002155280 | A2 | 20020528 | JP 2000-353261 | 20001120 |
| | US 2002119261 | A1 | 20020829 | US 2001-985812 | 20011106 |
| | US 6641872 | B2 | 20031104 | | |
| PRAI | JP 2000-353261 | A | 20001120 | | |
| OS | MARPAT | 136:409119 | | | |
| AB | The compns. comprise (A) R1AZ1AZ2BR2 and (B) ≥1 compds. selected from R3AZ3D, R3ACF2OD, R4AZ4AZ5D, R4AZ5ACO2D, R4AZ5BZ3D, R4BZ5AZ3D, R4AZ4ACF2OD (A = p-C ₆ H ₁₀ ; B = 1,3-dioxane-2,5-diyl; D = 3-Y1-4-X1-5-Y2-phenyl; R1-4 = C ₁ -10-alkyl, alkoxy, alkoxymethyl, C ₂ -10-alkenyl; Z ₁ , Z ₂ , Z ₅ = single bond, C ₂ H ₄ ; Z ₃ = single bond, C ₂ H ₄ , CO ₂ ; Z ₄ = single bond, C ₂ H ₄ , CH:CH; X ₁ = F, Cl, CF ₃ , OCF ₂ H, OCF ₃ ; Y ₁ , Y ₂ = H, F). | | | | |
| ST | liq crystal cyclohexylene dioxanediyl reflection LCD; active matrix reflection liq crystal display | | | | |
| IT | Liquid crystals (liquid crystal compns. with reduced refractive index anisotropy for active-matrix reflection LCD with wide range of operation temperature) | | | | |
| IT | Liquid crystal displays (reflection; liquid crystal compns. with reduced refractive index anisotropy for active-matrix reflection LCD with wide range of operation temperature) | | | | |
| IT | 67589-39-3D, mixture containing 79912-83-7D, mixture containing 79912-85-9D, mixture containing 80944-44-1D, mixture containing 81701-13-5D, mixture containing 82832-27-7D, mixture containing 82832-57-3D, mixture containing 84540-32-9D, mixture containing 84656-75-7D, mixture containing 86778-48-5D, mixture containing 88416-69-7D, mixture containing 88416-70-0D, mixture containing 88416-73-3D, mixture containing 88878-50-6D, mixture containing 96624-52-1D, mixture containing 110881-30-6D, mixture containing 118164-50-4D, mixture containing 118164-51-5D, mixture containing 131790-57-3D, mixture containing 131819-23-3D, mixture containing 131819-24-4D, mixture containing 131819-25-5D, mixture containing 132123-45-6D, mixture containing 137529-56-7D, mixture containing 137784-79-3D, mixture containing 137810-19-6D, mixture containing 139136-72-4D, mixture containing 139420-31-8D, mixture containing 142223-50-5D, mixture containing 144583-01-7D, mixture containing 148462-51-5D, mixture containing 148462-52-6D, mixture containing 175859-25-3D, mixture containing 178689-87-7D, mixture containing 181943-56-6D, mixture containing | | | | |

181943-57-7D, mixture containing 181943-58-8D, mixture containing
 192221-89-9D,
 mixture containing 192221-94-6D, mixture containing 197247-35-1D, mixture
 containing
 207463-16-9D, mixture containing 208338-50-5D, mixture containing
 208338-51-6D, mixture containing 208338-52-7D, mixture containing
 208338-57-2D,
 mixture containing 208338-60-7D, mixture containing 208338-88-9D, mixture
 containing
 208531-64-0D, mixture containing 208531-73-1D, mixture containing
 208531-75-3D,
 mixture containing **213591-60-7D**, mixture containing **213591-64-1D**, mixture
 containing **268550-43-2D**, mixture containing **346710-91-6D**, mixture containing
 352566-00-8D, mixture containing **431065-49-5D**, mixture containing
 431065-50-8D,
 mixture containing **431065-51-9D**, mixture containing **431065-52-0D**, mixture
 containing
 431065-53-1D, mixture containing **431065-54-2D**, mixture containing
 431065-55-3D,
 mixture containing **431065-56-4D**, mixture containing **431065-57-5D**, mixture
 containing
 431065-58-6D, mixture containing **431065-59-7D**, mixture containing
 431065-60-0D,
 mixture containing **431065-61-1D**, mixture containing **431065-62-2D**, mixture
 containing
 431065-63-3D, mixture containing **431065-64-4D**, mixture containing
 431065-65-5D,
 mixture containing **431065-66-6D**, mixture containing **431065-67-7D**, mixture
 containing
 RL: TEM (Technical or engineered material use); USES (Uses)
 (liquid crystal compns. with reduced refractive index anisotropy for
 active-matrix reflection LCD with wide range of operation temperature)

IT **207463-16-9D**, mixture containing **213591-60-7D**, mixture containing
268550-43-2D, mixture containing
 RL: TEM (Technical or engineered material use); USES (Uses)
 (liquid crystal compns. with reduced refractive index anisotropy for
 active-matrix reflection LCD with wide range of operation temperature)

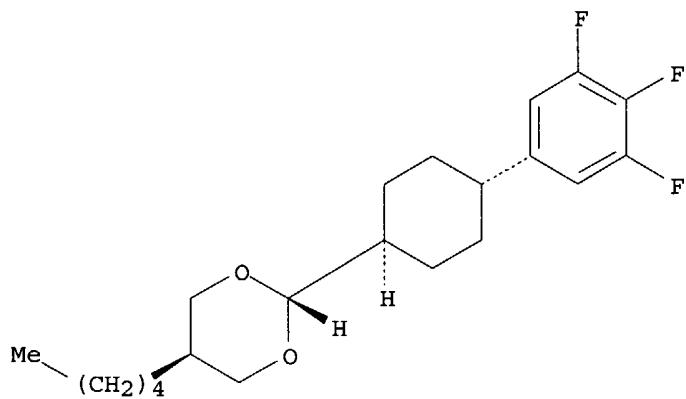
RN **207463-16-9 CAPPLUS**
 CN Cyclohexanecarboxylic acid, 4-pentyl-, 3,4,5-trifluorophenyl ester, trans-
 (9CI) (CA INDEX NAME)

Relative stereochemistry.



RN **213591-60-7 CAPPLUS**
 CN 1,3-Dioxane, 5-pentyl-2-[trans-4-(3,4,5-trifluorophenyl)cyclohexyl]-,
 trans- (9CI) (CA INDEX NAME)

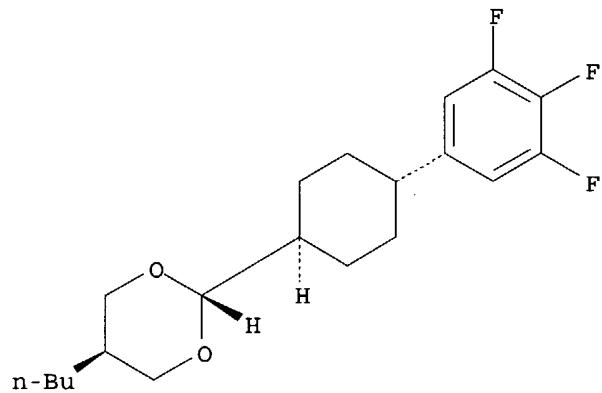
Relative stereochemistry.



RN 268550-43-2 CAPLUS

CN 1,3-Dioxane, 5-butyl-2-[trans-4-(3,4,5-trifluorophenyl)cyclohexyl]-, trans- (9CI) (CA INDEX NAME)

Relative stereochemistry.



AN 2002:808067 CAPLUS
 DN 137:331157
 ED Entered STN: 24 Oct 2002
 TI Liquid crystal composition for UV shutter
 IN Yano, Shinichi; Kato, Takashi; Miyazawa, Kazutoshi
 PA Chisso Corp., Japan; Chisso Petrochemical Corporation
 SO Jpn. Kokai Tokkyo Koho, 31 pp.
 CODEN: JKXXAF
 DT Patent
 LA Japanese
 IC ICM C09K019-42
 ICS C09K019-30; C09K019-34; G02F001-13
 CC 74-13 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)
 Section cross-reference(s): 73
FAN.CNT 1

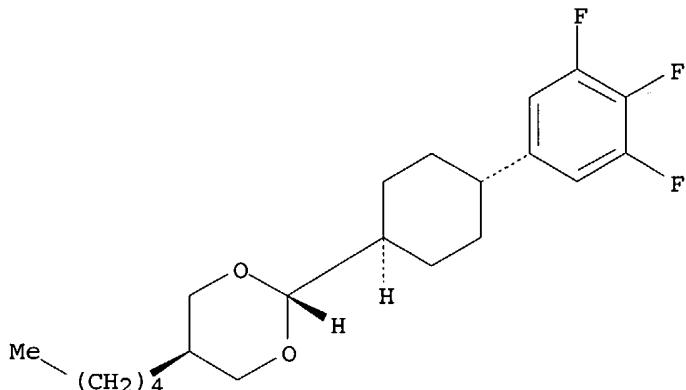
| | PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|------|-------------------|------|----------|-----------------|----------|
| PI | JP 2002309255 | A2 | 20021023 | JP 2002-23640 | 20020131 |
| PRAI | JP 2001-33382 | A | 20010209 | | |
| OS | MARPAT 137:331157 | | | | |

 AB The invention relates to a liquid crystal composition, suited for use in making a switchable UV shutter that may be integrated into a printer head, a photolithog. apparatus, a fluorescence display, etc., comprising ≥ 2 liquid crystal compds. having 2 .apprx. 4 cyclic groups and optionally an optically active compound, wherein the cyclic group contained in the liquid crystal compound is para-divalent.
 ST liq crystal compn UV shutter
 IT Liquid crystals
 Optical imaging devices
 Shutters
 (liquid crystal composition for UV shutter)

| | | | | | | |
|----|---|-------------|-------------|--------------------|-------------|------------|
| IT | 7465-91-0 | 22692-80-4 | 56131-48-7 | 56131-49-8 | 59855-05-9 | 61203-99-4 |
| | 67589-39-3 | 67589-41-7 | 67589-47-3 | 67589-52-0 | 67589-53-1 | |
| | 67589-72-4 | 70567-18-9 | 70602-95-8 | 74240-64-5 | 74240-65-6 | |
| | 79319-27-0 | 79912-85-9 | 79945-42-9 | 80944-44-1 | 81701-13-5 | |
| | 81936-32-5 | 82406-82-4 | 82406-83-5 | 82492-42-0 | 82832-27-7 | |
| | 82832-57-3 | 84655-98-1 | 84656-75-7 | 84656-77-9 | 85312-59-0 | |
| | 86579-52-4 | 86776-50-3 | 86776-51-4 | 86776-52-5 | 86778-48-5 | |
| | 86786-89-2 | 88038-92-0 | 88416-69-7 | 88878-50-6 | 92263-41-7 | |
| | 93743-04-5 | 96184-42-8 | 96624-41-8 | 96624-52-1 | 97398-80-6 | |
| | 98321-58-5 | 100980-86-7 | 101478-47-1 | 102714-95-4 | 107215-74-7 | |
| | 107392-35-8 | 110881-30-6 | 112026-68-3 | 114291-10-0 | 116090-24-5 | |
| | 116090-25-6 | 116090-26-7 | 116090-30-3 | 116090-36-9 | 116090-37-0 | |
| | 117923-19-0 | 117923-21-4 | 117943-37-0 | 118164-50-4 | 118164-51-5 | |
| | 120893-64-3 | 123560-48-5 | 123787-68-8 | 124728-81-0 | 124729-02-8 | |
| | 129738-34-7 | 129738-42-7 | 131315-33-8 | 131819-23-3 | 131819-24-4 | |
| | 131899-35-9 | 132123-39-8 | 132123-43-4 | 132123-45-6 | 132123-46-7 | |
| | 133937-72-1 | 134412-17-2 | 134412-18-3 | 137529-40-9 | 137529-41-0 | |
| | 137529-56-7 | 137529-63-6 | 139136-72-4 | 139420-31-8 | 142400-92-8 | |
| | 146781-29-5 | 146781-31-9 | 148462-51-5 | 148462-52-6 | 153227-45-3 | |
| | 153227-50-0 | 153227-53-3 | 153429-48-2 | 155041-85-3 | 173306-39-3 | |
| | 174350-05-1 | 174350-07-3 | 174350-08-4 | 175859-23-1 | 175859-24-2 | |
| | 175859-25-3 | 175859-28-6 | 178689-87-7 | 181943-57-7 | 181943-58-8 | |
| | 183145-19-9 | 183388-45-6 | 184161-94-2 | 186320-72-9 | 196870-32-3 | |
| | 197012-69-4 | 197247-35-1 | 208528-35-2 | 213591-60-7 | | |
| | 213591-64-1 | 261728-96-5 | 264615-90-9 | 268550-24-9 | 303186-20-1 | |
| | 473743-35-0 | 473743-36-1 | 473743-37-2 | 473743-38-3 | | |
| | 473774-82-2 | 473774-84-4 | | | | |
| | RL: DEV (Device component use); USES (Uses) | | | | | |
| | (liquid crystal composition for UV shutter) | | | | | |
| IT | 213591-60-7 473743-35-0 | | | | | |
| | RL: DEV (Device component use); USES (Uses) | | | | | |

(liquid crystal composition for UV shutter)
RN 213591-60-7 CAPLUS
CN 1,3-Dioxane, 5-pentyl-2-[trans-4-(3,4,5-trifluorophenyl)cyclohexyl]-, trans- (9CI) (CA INDEX NAME)

Relative stereochemistry.

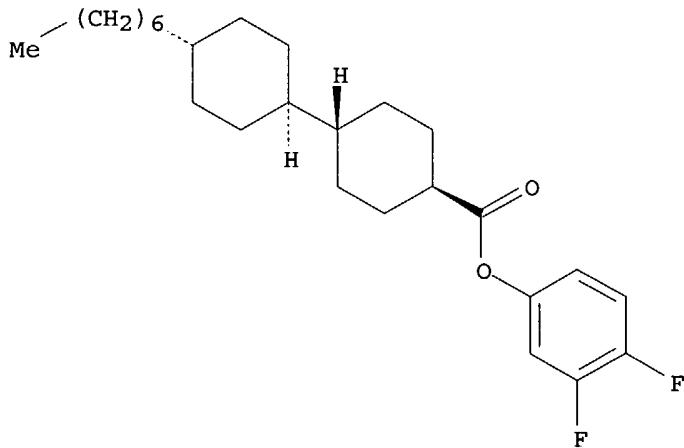


RN 473743-35-0 CAPLUS
CN [1,1'-Bicyclohexyl]-4-carboxylic acid, 4'-heptyl-, 3,4-difluorophenyl ester, [trans(trans)]-, mixt. with 3,4-difluorophenyl trans-4'-heptylcyclohexanecarboxylate, 3,4-difluorophenyl [trans(trans)]-4'-pentyl[1,1'-bicyclohexyl]-4-carboxylate and 3,4-difluorophenyl trans-4-pentylcyclohexanecarboxylate (9CI) (CA INDEX NAME)

CM 1

CRN 97398-76-0
CMF C26 H38 F2 O2

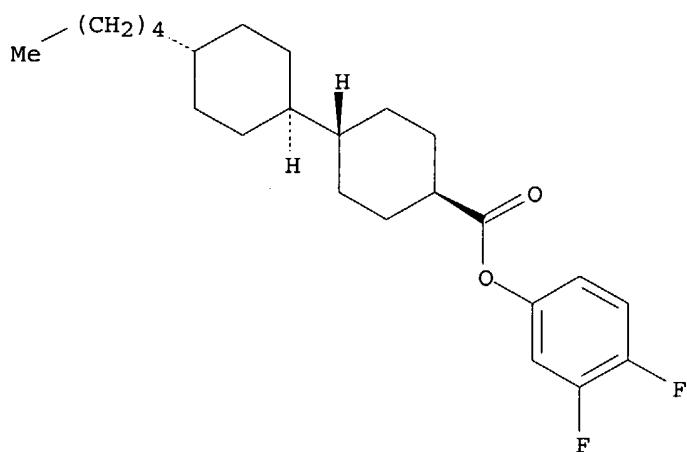
Relative stereochemistry.



CM 2

CRN 97398-75-9
CMF C24 H34 F2 O2

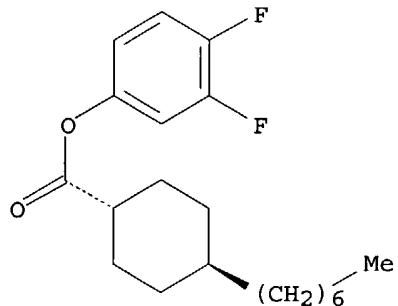
Relative stereochemistry.



CM 3

CRN 94737-84-5
CMF C₂₀ H₂₈ F₂ O₂

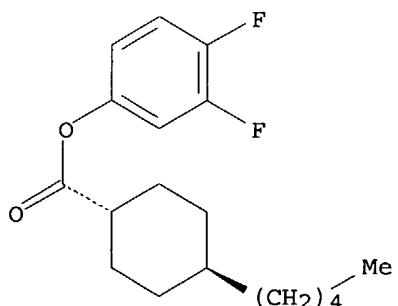
Relative stereochemistry.



CM 4

CRN 94737-82-3
CMF C₁₈ H₂₄ F₂ O₂

Relative stereochemistry.



AN 2004:391943 CAPLUS
 DN 140:415045
 ED Entered STN: 14 May 2004
 TI Liquid crystal composition and liquid crystal display element
 IN Saito, Masayuki
 PA Japan
 SO U.S. Pat. Appl. Publ., 14 pp.
 CODEN: USXXCO
 DT Patent
 LA English
 IC ICM C09K019-34
 ICS C09K019-30; C09K019-20
 NCL 252299610; 252299630; 252299670
 CC 74-13 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)
 FAN.CNT 1

| | PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|------|--------------------------------|----------|----------------------|----------------------------------|----------------------|
| PI | US 2004089844 JP 2004149691 | A1 A2 | 20040513 20040527 | US 2003-697879 JP 2002-317432 | 20031031 20021031 |
| PRAI | JP 2002-317432 | A | 20021031 | | |
| GI | | | | | |

* STRUCTURE DIAGRAM TOO LARGE FOR DISPLAY - AVAILABLE VIA OFFLINE PRINT *

AB A liquid crystal composition for liquid crystal display comprises as a first component, at least one compound selected from a group of compds. represented by Formula I (R1 = alkyl; X1 = H, F); as a second component, at least one compound selected from a group of compds. represented by Formula II; as a third component, at least one compound selected from a group of compds. represented by Formula III (R2 = alkyl, alkenyl; A1 = 1,4-phenylene in which any hydrogen may be replaced by fluorine; X1 = H, F); as a forth component, at least one compound selected from a group of compds. represented by Formula IV (R2 = alkyl, alkenyl; R3 = alkyl, alkoxy, CF3; A2 = 1,4-cyclohexylene, 1,4-phenylene); and as a fifth component, at least one compound selected from a group of compds. represented by Formulas V (R2 = alkyl, alkenyl; R4 = alkyl, alkoxy; A2 = 1,4-cyclohexylene, 1,4-phenylene; Z1 =single bone; COO; A2 = 1,4-cyclohexylene, 1,4-phenylene;) and VI (R1 = alkyl; R5 = alkyl, alkoxyethyl; A1 = 1,4-phenylene in which any hydrogen may be replaced by fluorine; A2 = 1,4-cyclohexylene, 1,4-phenylene; Z1 =single bone; COO; X1 = H, F).

ST liq crystal compn display element
 IT Liquid crystal displays
 Liquid crystals
 (liquid crystal composition for liquid crystal display element)

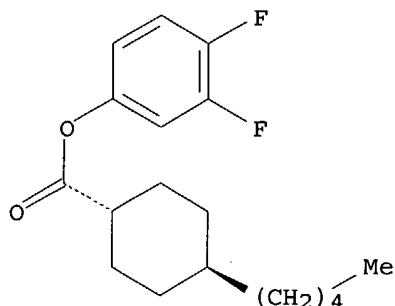
| | | | | | |
|----|--|--|---|---|---|
| IT | 80944-44-1 82985-80-6 85312-59-0 96624-52-1 115978-59-1 132123-45-6 142400-92-8 181943-55-5 207463-16-9 352566-00-8 | 80955-71-1 83242-83-5 88038-92-0 97398-80-6 118164-50-4 133261-31-1 153429-48-2 183272-43-7 213591-60-7 688358-85-2 | 81701-13-5 84655-98-1 88878-50-6 102714-92-1 129738-34-7 134412-18-3 155041-85-3 196699-20-4 94737-82-3 131790-57-3 137489-25-9 173837-35-9 196699-38-4 | 82832-57-3 84656-75-7 94737-82-3 106349-49-9 110881-30-6 131819-23-3 139215-80-8 181369-18-6 207462-53-1 268550-43-2 | 82985-79-3 84656-77-9 96624-43-0 110881-30-6 131819-23-3 139215-80-8 181369-18-6 207462-53-1 |
|----|--|--|---|---|---|

RL: TEM (Technical or engineered material use); USES (Uses)
 (liquid crystal composition for liquid crystal display element)

IT 94737-82-3 207462-53-1 207463-16-9
 213591-60-7 268550-43-2 688358-85-2
 RL: TEM (Technical or engineered material use); USES (Uses)

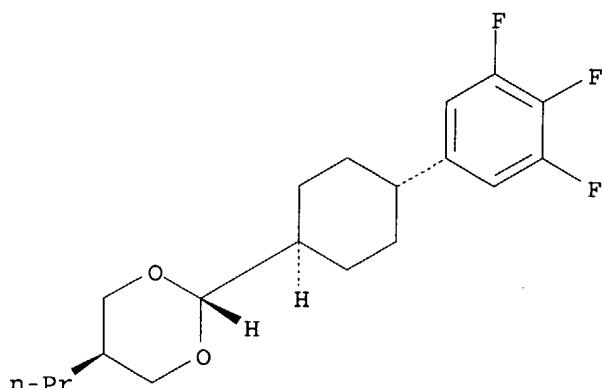
(liquid crystal composition for liquid crystal display element)
RN 94737-82-3 CAPLUS
CN Cyclohexanecarboxylic acid, 4-pentyl-, 3,4-difluorophenyl ester, trans-
(9CI) (CA INDEX NAME)

Relative stereochemistry.



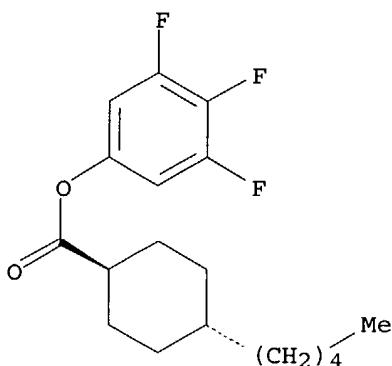
RN 207462-53-1 CAPLUS
CN 1,3-Dioxane, 5-propyl-2-[trans-4-(3,4,5-trifluorophenyl)cyclohexyl]-, trans- (9CI) (CA INDEX NAME)

Relative stereochemistry.



RN 207463-16-9 CAPLUS
CN Cyclohexanecarboxylic acid, 4-pentyl-, 3,4,5-trifluorophenyl ester, trans-
(9CI) (CA INDEX NAME)

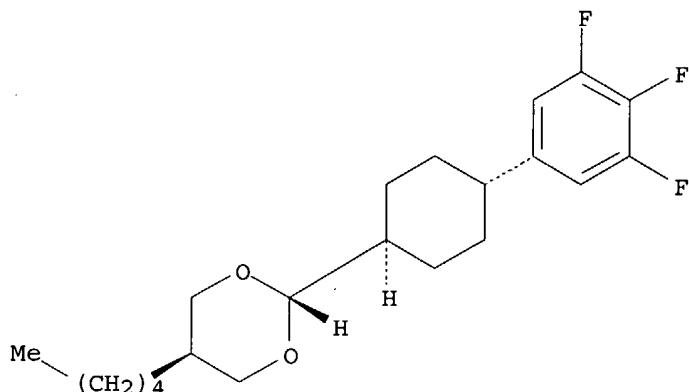
Relative stereochemistry.



RN 213591-60-7 CAPLUS

CN 1,3-Dioxane, 5-pentyl-2-[trans-4-(3,4,5-trifluorophenyl)cyclohexyl]-,
trans- (9CI) (CA INDEX NAME)

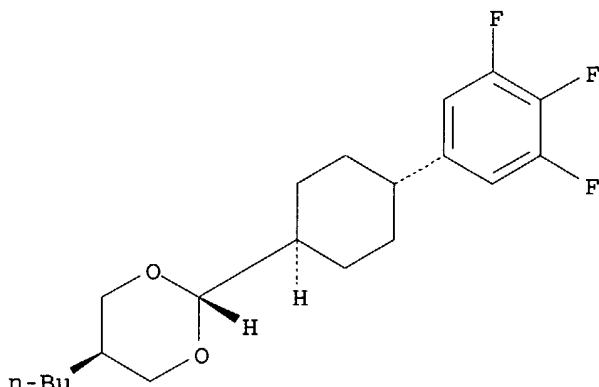
Relative stereochemistry.



RN 268550-43-2 CAPLUS

CN 1,3-Dioxane, 5-butyl-2-[trans-4-(3,4,5-trifluorophenyl)cyclohexyl]-,
trans- (9CI) (CA INDEX NAME)

Relative stereochemistry.



RN 688358-85-2 CAPLUS

CN Cyclohexanecarboxylic acid, 4-(methoxymethyl)-, 3,4,5-trifluorophenyl
ester, trans- (9CI) (CA INDEX NAME)

Relative stereochemistry.

